



An exploration of the component validity of job crafting

Qiao Hu^a, Toon W. Taris^b, Maureen F. Dollard^{c,d} and Wilmar B. Schaufeli^{b,e}

^aSchool of Management, Zhejiang University of Technology, Hangzhou, China; ^bDepartment of Social, Health and Organizational Psychology, Utrecht University, Utrecht, The Netherlands; ^cCentre for Workplace Excellence, University of South Australia, Adelaide, Australia; ^dSchool of Medicine, University of Nottingham, Nottingham, UK; ^eDepartment of Work, Organizational and Personnel Psychology, University of Leuven, Leuven, Belgium

ABSTRACT

Interest in job crafting as a means to create more work meaning has led to the development of multi-perspective conceptualizations of job crafting. Although useful comprehensive portraits of complex job crafting activities have emerged, these synthetic conceptualizations tend to overlap, and even inconsistent with each other. This study aimed to clarify these blurred conceptualizations by examining the component and incremental validity of five distinct job crafting measures and their theoretical propositions in predicting work engagement and innovation behaviour.

A cross-sectional sample of 162 health professionals and a two-wave longitudinal sample of 130 R&D employees were used. Results revealed that approach crafting is mainly composed of approach-promoting behaviour and active coping behaviour. In predicting work engagement and innovation behaviour, active coping behaviour was distinguished from withdrawal behaviour; role identities crafting was less strongly associated with these outcomes than job characteristics; cognitive crafting accounted for small increments in the variance beyond behaviour crafting. Apparently, crafting essentially comprises behaviour with a positive attitude. Withdrawal behaviour should be removed from crafting concept because its maladaptive perspective is negative. Job crafting measures which promote situational characteristics with personal meaningfulness, as well as precise descriptions of behaviour crafting and cognitive crafting, are recommended.

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Introduction

The wish for having a meaningful job is one of the most widely held goals by which people measure and motivate themselves. Engaging in job crafting behaviour opens new possibilities for the creation of meaning in any job by altering the way in which it is constructed. Berg et al. (2008) refer to job crafting as an action by which people utilize opportunities to customize their jobs. Following Wrzesniewski and Dutton (2001) distinction among task, relational, and cognitive crafting perspectives, researchers have attempted to conceptualize and measure job crafting based on a theoretical synthesis of its objects and ways of action. However, these synthesized job crafting concepts are not entirely clear about the meaning of specific job crafting concepts and the propositions they yield. This study therefore aims to provide a comprehensive understanding of the divergent job crafting perspectives to increase clarity on the theoretical concept of job crafting. We focused on the theoretical components of five distinct job crafting measures (see Table 1) – the Dutch Job Crafting Scale (JCS; Tims et al., 2012), the Job Crafting Questionnaire (JCQ; Slemp & Vella-Brodrick, 2013), the Job Crafting Measure (JCM; Weseler & Niessen, 2016), the Overarching Job Crafting Scale (OJCS; Vanbelle, 2017), and the Combined Job Crafting Scale (CJCS; Bizzi, 2017) – and the incremental validity of integrated subscales that hold the same theoretical perspectives, in predicting meaningful work outcomes

(work engagement and innovation behaviour). Our aim was to find overlap or complementarity, as well as possible inconsistencies in multiple-lens job crafting theoretical views. This study thus contributes to the understanding of how divergent theoretical views on job crafting can be integrated more precisely.

Job crafting as meaningful self-regulation, and associated work outcomes

Job crafting as a form of meaningful self-regulation captures how individuals adapt their work, leading to positive integration and better fit with their work role (Berg, Wrzesniewski et al., 2010; Wrzesniewski & Dutton, 2001). According to Wrzesniewski and Dutton (2001), three motivational forces drive job crafting activities – the desire for control and meaning, for having a positive self-image, and for connection with others. This idea of job crafting is rooted in self-determination theory (Ryan & Deci, 2011), whereby autonomous self-regulation creates a link between job crafting and need fulfilment, i.e., feelings of value and meaningfulness. Self-regulation motivation has been associated with a number of positive outcomes, including higher psychological well-being (e.g., Csikszentmihalyi & Rathunde, 1993) and creativity (e.g., Amabile, 1996).

Job crafting is primarily concerned with the pursuit of individual positive psychological conditions by actively changing the work environment (Hu et al., 2019). When people seek ways

Table 1. Conceptualizations and measures of job crafting.

Citation	Job crafting dimensions	Examples of relevant scale items	Theoretical perspectives [#]
Wrzesniewski and Dutton (2001)	Task crafting Relational crafting Cognitive crafting	Taking control over job tasks; modifying the quantity (i.e., number) or quality (i.e., content) of job tasks. Altering the quantity or quality of workplace relationships.	Cognitive- behaviour
Ghitulescu (2006)	Task crafting Relational crafting Cognitive crafting	"Psychological redefinitions and reinterpretations of job characteristics." "How often do you teach concepts in small steps that are more manageable for some students in your math classes?" "In an average month, about how many times do you talk to administrators about math instruction?" "My job is very significant and important – the results of my work are likely to significantly affect the lives or well-being of other people."	Cognitive- behaviour
Leana et al. (2009)	Individual crafting Collaborative crafting Job crafting	Introduce new approaches on your own to improve your work in the classroom. Work together with your co-workers to introduce new approaches to improve your work in the classroom.	Cognitive- behaviour
Berg, Grant et al. (2010)	Job crafting	Task expanding (e.g., highlighting assigned tasks); job expanding (e.g., adding tasks); Role reframing (e.g., altering role perceptions).	Cognitive- behaviour Approach-avoidance Job characteristics -role identities Cognitive- behaviour
Volman (2011)	Leisure crafting Task crafting Relational crafting	Vicarious experiencing: hobby experiencing "I, by myself, made work more challenging."	Cognitive- behaviour
Tims and Bakker (2010)	Increasing job demands Decreasing job demands	"I, by myself, ask advice from my co-workers to solve difficulties in my job." Adding job tasks; volunteering for interesting project groups; taking over tasks from their supervisor. Asking colleagues to help them with their tasks; reducing the number of interactions with demanding customers or colleagues.	Cognitive- behaviour Approach-avoidance
Tims et al. (2012)* JCS	Increasing job resources Increasing structural job resources Increasing social job resources Increasing challenging demands Decreasing hindering demand	Seeking social support; enhancing job autonomy. "I try to develop my capabilities." "I ask my supervisor to coach me." "When an interesting project comes along, I offer myself proactively as project co-worker." "I make sure that my work is mentally less intense."	Cognitive- behaviour Approach-avoidance
Petrou et al. (2012)	Seeking resources Seeking challenges Reducing demands Increasing challenging job demands	"I ask others for feedback on my job performance." "I ask for more tasks if I finish my work." "I try to ensure that my work is emotionally less intense." "When a new task comes up, I sign up for it."	Cognitive- behaviour Approach- avoidance Cognitive- behaviour Approach- avoidance
Nielsen and Abildgaard (2012)	Decreasing social job demands Increasing social job resources Increasing quantitative job demands Decreasing hindering job demands	"I try to avoid emotionally challenging situations with my customers." "I ask for feedback on my performance from customers." "When there isn't much to do, I offer my help to colleagues." "I ensure that my work is the least burdening/straining."	Cognitive- behaviour Approach- avoidance Cognitive- behaviour Approach- avoidance
Slemp and Vella-Brodrick (2013)* JCO Vanbelle (2017)* OJCS	Task crafting Relational crafting Cognitive crafting	"Change the scope or types of tasks that you complete at work." "Engage in networking activities to establish more relationship." "Think about how your job gives you purpose." I make changes to my job to feel better.	Cognitive- behaviour Cognitive- behaviour Cognitive- behaviour
Niessen et al. (2016)	Task crafting Relational crafting Cognitive crafting	"... I concentrate on specific tasks." "... I usually limit the amount of time I spend with people I do not get along well with, and only contact them for things that are absolutely necessary." "... I try to look upon the tasks and responsibilities I have at work as having a deeper meaning than is readily apparent."	Cognitive- behaviour Cognitive- behaviour

(Continued)

Table 1. (Continued).

Citation	Job crafting dimensions	Examples of relevant scale items	Theoretical perspectives [#]
Weseler and Niessen (2016)* JCM	Extending task boundaries	"So that the job I do suits me, [...]"	Cognitive-behaviour Approach-avoidance Job characteristics -role identities
	Reducing task boundaries	I concentrate on specific tasks.	
	Extending relational boundaries	I decide (alone or together with colleagues/supervisors) not to work on less suitable tasks. I invest in relationships with people whom I get along with the best.	
	Reducing relational boundaries	I try to avoid contact with the people at work whom I do not really get on well with	
Lichtenthaler and Fischbach (2016)	Cognitive crafting	I find personal meaning in my tasks and responsibilities at work.	Cognitive-behaviour Approach-avoidance
	Promotion-focused job crafting	Identical items to Tims et al. (2012) "increasing" dimensions.	
	Prevention-focused job crafting	Identical items to Tims et al. (2012) "decreasing" dimension.	
	Task crafting	I introduced new approaches on my own to improve my work.	
Bizzi (2017)* CJCS Bruning and Campion (2018)	Approach role crafting	Expand my role by providing opinions on important issues.	Cognitive-behaviour Approach-avoidance Job characteristics -role identities
	Work role expansion	Actively initiate positive interactions with others at work.	
	Social expansion	Find ways to get others to take my place in meetings.	
	Avoidance role crafting	Create structure in my work processes.	
	Work role reduction	Use new knowledge or technology to enhance communication.	
	Approach resource crafting	Use my thoughts to put myself into a good mood at work.	
	Work organization	Work in a way that allows me to avoid others at work.	
	Adoption		
	Metacognition		
	Avoidance resource crafting		
	Withdrawal crafting		

Note: Cf. Rudolph et al. (2017). [#] Theoretical perspectives is the new contribution and only focus on individual crafting in the work domain. * These job crafting scales are used in the analysis.

to craft their work to be more meaningful and purposeful, their motives and strengths tap into parallel personal desires and abilities, making people feel passionate and energetic about what they do. For example, several studies revealed that job crafting relates positively to the persistent and pervasive state of mind of work engagement, characterized by vigour, dedication, and absorption (Demerouti et al., 2015; Petrou et al., 2012; Schaufeli et al., 2006; Tims et al., 2012).

Job crafting fosters the meaning of work not only by adapting the existing work environment to improve mental health, but it also includes learning and development in order to react adaptively to dynamic and unpredictable environments (Parker, 2014). Innovative work behaviour (i.e., extra-role behaviour aimed at the generation, introduction, and application of ideas, processes, products, or procedures; Janssen, 2000) can be conceived as a form of problem-focused coping to help the individual improve person-job fit by generating, promoting, and realizing ideas for modifying oneself or the work environment (Janssen, 2000). Job crafting as a learning process can lead to the identification of problems and generation of novel solutions (Peeters et al., 2016; Savickas & Porfeli, 2012). The persistence and focus needed for actually implementing work changes are particularly relevant to novel idea implementation (Baer, 2012). Thus, job crafting is likely to be an important driver of innovative work behaviour.

Job crafting conceptualizations

Job crafting refers to the activities in which people engage to proactive reframe or reshape their jobs, making them experience different kinds of meaning of the work and themselves (Berg et al., 2008). In recent years, researchers have developed theoretical frameworks for describing the complex work activities involved in job crafting, and accordingly for explaining the outcomes of job crafting. Most dimension-level operational definitions are based on the classical cognitive-behaviour research paradigm and have focused on job crafting content (i.e., WHAT job property is crafted?) and job crafting form (i.e., HOW is this property crafted?). Table 1 provides an overview of the job crafting taxonomies used to date. Drawing upon well-defined situational theoretical frameworks (especially Job characteristics theory, Hackman & Oldham, 1980, and the Job demands-resources model; Bakker & Demerouti, 2007), crafting the *content* of a job involves changing the task and relational resources and job demands at work. Job crafting requires a self-aware sensemaker to derive meaning, that is, the self is critical in interpreting the motivational gains derived from redesigning work (Barrick et al., 2013). Researchers further developed content job crafting theoretically by integrating situational factors with self-construal to form role identities crafting in the workplace.

Regarding *how* to craft, the idea that approach and avoidance are the building blocks of behaviour is often considered. To represent these two distinct kinds of job crafting action tendencies, researchers have relied on a variety of largely synonymous terms: increasing and decreasing (e.g., Petrou et al., 2012; Tims et al., 2012), expansion and contraction (reduction) (e.g., Bruning & Campion, 2018; Weseler & Niessen, 2016),

or promotion and prevention (e.g., Lichtenthaler & Fischbach, 2016, 2019).

Integrating the categories of WHAT and HOW, researchers have developed diverse job crafting concepts and propositions, which are reflected in the cognitive-behavioural perspective on job crafting (e.g., Slemp & Vella-Brodrick, 2013; Wrzesniewski & Dutton, 2001), the role identities-job characteristics perspective on job crafting (e.g., Bruning & Campion, 2018; Weseler & Niessen, 2016), and the approach-avoidance perspective on job crafting (e.g., Bruning & Campion, 2018; Nielsen & Abildgaard, 2012; Weseler & Niessen, 2016) (see Table 1). For example, Tims and Bakker (2010), (2012), and Petrou et al. (2012) positioned job crafting within the action-phase sequence of job characteristics by increasing resources and managing demands. Lichtenthaler and Fischbach (2016, 2019) use approach-avoidance form in tangible work role boundaries (i.e., changes in motivating job characteristics), to shape promotion-prevention-oriented job crafting. The work role expansion strategy of Bruning and Campion (2018) that combines task characteristics, role identities, and approach work behaviour indicates that employees not only change their tasks by including elements not originally prescribed in the job description but also by integrating personal and work domains (Lazazzara et al., 2020).

Although these conceptualizations of job crafting are theoretically interesting and potentially useful, several issues remain. First, approach job crafting behaviour is motivated and directed towards positive goals, while avoidance job crafting behaviour requires that workers remain vigilant for possible threats and anticipate and avoid these threats. Two types of avoidance job crafting behaviour have different motivations (Lang & Bradley, 2013). One type involves active coping behaviour with defensive motivation by optimizing hindrance demands to avoid potential losses and restore person-job fit. The other type is withdrawal behaviour with aversive motivation by shrinking laborious demands to keep from the harmful stimulus. Under avoidance job crafting, active coping behaviour may be a type of "approach" job crafting behaviour that differs from withdrawal behaviour. Second, both research on job characteristics crafting (i.e., acquiring resources and/or reducing demands to meet work requirements; Tims et al., 2012) and on role identities crafting (i.e., expanding and shrinking work role boundaries to increase extra psychological gains; Bruning & Campion, 2018), demonstrates that crafting involves the optimization of psychological energy towards benign wellbeing. However, distinguishing job characteristics crafting from role identity crafting is difficult, especially since job characteristics to some degree also represent role identities (Hu et al., 2019). Third, job crafting explanations have distinguished behaviour crafting from cognitive crafting when they actually contain cognitive elements. In crafting, people must make conscious behavioural choices in response to situational factors (Zhang & Parker, 2019). The appropriateness and effectiveness of these choices depend on individuals' cognitive understanding of the surrounding environment. This implies that the behaviours involved in behaviour crafting actually contain cognitive elements.

Approach and avoidance job crafting behaviour

Job crafting, taken as bringing about meaningful work changes, involves a sense of adaptive ability to adjust oneself to fulfill personal needs and goals (Tims & Bakker, 2010; Wrzesniewski & Dutton, 2001). However, people differ in the extent to which they are willing and able to develop adaptive responses to address changing environmental conditions (Savickas, 2013; Savickas & Porfeli, 2012). A person's appraisal of his/her job plays a pivotal role in their motivation and behavioural responses (Eschleman et al., 2012). A positive appraisal of job characteristics leads individuals to adopt approach-promoting work behaviour such as increasing structural job resources and increasing challenging job demands. Conversely, a stress appraisal of job characteristics leads individuals to adopt avoidance behaviours (i.e., decreasing hindrance demands and shrinking task and relational boundaries). According to this perspective, approach job behaviour contributes to work motivation by enabling employees to experience their work as meaningful. In turn, these behaviours allow for the successful integration of the self into the work role. Employees engage in facilitative forms of avoidance behaviour to stabilize a situation and to minimize its negative consequences, while the active avoidance process is coping-related defensive engagement; thus, this essentially contains an approach response. However, when the stressful stimulus is perceived as more formidable, employees will increase their distance to the harmful event with aversive motivation. These discrepancy-enlarging processes create an escape, ranging from minor withdrawal behaviours (e.g., social loafing and taking long lunch breaks) to more serious withdrawal behaviours (e.g., lateness, absence, and turnover, Koslowsky, 2009).

Job crafting represents the actions that employees take with the goal of becoming more engaged, resilient, and thriving at work (Berg et al., 2008). As such, job crafting could help employees to deal with stressors that may otherwise result in negative work-related well-being. However, researchers have found the "avoidance-type" crafting to retain ambiguous features (Zhang & Parker, 2019). Certain avoidance crafting behaviours seem to be "prevention-focused" types of self-regulation that unfavourably relate to health and motivation, while other avoidance crafting behaviours show opposite patterns that likely reflect "promotion-focused" self-regulation that produces favourable changes. For example, Demerouti and Peeters (2018) found that hindering demands can be crafted in a "promotion-focused" way by optimizing demands to make work more efficient. Job crafting emphasizes positive workplace behaviour (Walk & Handy, 2018; Wrzesniewski & Dutton, 2001), whereas avoidance behaviour involves denying, minimizing, or otherwise avoiding dealing directly with stressful demands and is closely linked to distress and depression (Holahan et al., 2005). Zhang and Parker (2019) proposed that individuals have tendencies to move towards positive and away from negative end-states, and that approach and avoidance tendencies can influence regulatory focus when people pursue their goals. Again, it seems that the findings in the literature about the nature of crafting, here in relation to avoidance crafting behaviour, need to be clarified further.

Hypothesis 1: Job crafting is mainly consistent with approach job crafting behaviour (i.e., approach-promoting behaviour and active coping behaviour) (H1a). Active coping behaviour is distinguished from withdrawal behaviour in predicting meaningful work outcomes (work engagement and innovation behaviour) (H1b).

Job characteristics crafting and role identities crafting

Job characteristics crafting is defined as an individual, adaptive response to changing environmental conditions by balancing job demands and job resources to improve job-person fit or as a proactive strategy to seek resources and challenging demands to promote meaning and value at work (Demerouti, 2014). Hackman and Oldham (1980) suggested that job characteristics impact an individual's behaviour through their influence on psychological states such as experienced meaningfulness. Based on these assumptions, researchers further divided more proximal aspects of the work context into task characteristics and social characteristics (Grant, 2007). In the job demands-resources model (Bakker & Demerouti, 2007), job demands and job resources (i.e., task and relational resources; Hu et al., 2016) are further distinguished by their functional effects on work motivation. Accordingly, behaviours to reshape one's job characteristics fall into three categories: task and relational resources crafting and job demands crafting (Tims et al., 2012).

Role identities crafting enriches work meaning through altering the scope of the job (Bruning & Campion, 2018). To function effectively, individuals need a relatively secure and stable sense of social identity within a given situation. Role identities are cognitive self-concepts that people apply to themselves as a consequence of the structural role positions they occupy (Hogg et al., 1995). By taking on a particular identity, persons adopt self-meanings and expectations to accompany the role as it relates to other roles in the group and then act to represent and preserve these meanings and expectations (Stets & Burke, 2000). Much of the meaningful activity within a role that is governed by an identity revolves around the control of resources (Stets & Burke, 2000). Thus, role identities crafting typifies the line of work and overlaps with job characteristics.

Bruning and Campion (2018) argued that the fundamental difference between resource-based job crafting (i.e., job characteristics crafting) and role-based job crafting is that they relate to different self-regulation motivations. Job characteristics crafting involves an adaptive perspective of job design to meet work requirements through resources management, while role identities crafting involves a proactive perspective of job design to enrich work identity through altering the scope of the job (cf. Zhang & Parker, 2019). Bruning and Campion (2018) propose that job characteristics crafting is efficiency-oriented behaviour that is focused on external goals, while role identities crafting focuses on intrinsic motivation to enrich need-supply fit. They argue that both job characteristics crafting and role identities crafting deal with misalignment at work, and develop in a parallel manner.

Role identities crafting combines meaningfulness with value, significance, and purpose to people. Job characteristics crafting does the same, as this also has a motivational potential

for achieving work goals, stimulating personal growth and development (Bakker & Demerouti, 2007). When job characteristics (that can be considered as symbols conveying the relationship between self and others, such as independent versus interdependent tasks) prime people to think of themselves as distinct individuals, role identity occurs as a function of job characteristics that signal that their effort contributes to a meaningful whole. Self-regulation motivation not only opens up opportunities for employees to create meaningful experiences to express and maintain their role identities (Wrzesniewski & Dutton, 2001) but also provides the psychological energy needed to manage job resources and demands (Tims et al., 2012). The benign role of identity crafting is to a certain degree reflected in enriched jobs (Hackman & Oldham, 1980; Hu et al., 2017). Role identities crafting strategies (such as the extension and reduction of task and social boundaries) can also be construed as the crafting of work characteristics. Hence, both crafting concepts overlap to a certain degree.

Hypothesis 2: Job characteristics crafting partly overlaps with role identity crafting in predicting meaningful work outcomes (work engagement and innovation behaviour).

Cognitive crafting and behaviour crafting

Job crafting can involve making changes in the work situation, but also in the general motivational state that is related to the self (Wrzesniewski & Dutton, 2001). Cognitive crafting reflects cognitive adjustment at work when people reframe or redefine their job cognitively, forming it into a meaningful entity (Malo et al., 2016; Wrzesniewski & Dutton, 2001). This adjustment can boost work motivation by altering one's view of work in a more personally meaningful way (Slemp & Vella-Brodrick, 2013; Wrzesniewski & Dutton, 2001).

Some researchers argue that cognitive crafting is distinct from behaviour crafting, in that the capacity to modify or alter one's cognition as a core self-regulation skill is relevant across contexts (Tims et al., 2012). This type of cognitive crafting is a purely metacognitive change and does not involve visible behavioural changes to the task or the work relationships (Bruning & Campion, 2018; Zhang & Parker, 2019). Based on this metacognitive perspective, researchers treat cognitive crafting as a construct that is separate from behaviour crafting (Bruning & Campion, 2018; Slemp & Vella-Brodrick, 2013; Weseler & Niessen, 2016). However, cognitive processing, such as regulating attention processes, schematic processing of experiences, memory representation, and reconstruction, serves as scaffolds and supports not only for cognitive crafting but also for behavioural crafting. By analysing regularities in the covariation between situations and their thoughts and actions, individuals can identify the psychologically significant features of their work context that lead them to behave in a certain way (Bandura, 1991). Vallacher and Wegner (1987) assumed that individuals represent their actions on different levels in a cognitive hierarchy, and these levels of action identification convey an understanding of action, indicating why and how this action is done. Reframing cognition leads to the adjustment of action identification, which involves changes in the

current action or in the possible emergence of new behaviours. While cognitive crafting and behavioural crafting are conceptually unique, their relational interdependence suggests that an integration of prototypical cognitive and behavioural crafting may be possible.

Hypothesis 3: Behaviour crafting partly overlaps with cognitive crafting in predicting meaningful work outcomes (work engagement and innovation behaviour).

Research aims

Management research often uses combinations of ideas to advance new insights and develop novel hypotheses that can ultimately be tested empirically (Okhuysen & Bonardi, 2011). In this tradition, job crafting researchers have frequently used a multiple-lens perspective in which they integrated various theoretical perspectives in order to build their job crafting concepts and propositions. For example, Zhang and Parker (2019) proposed a hierarchical structure with three levels of crafting constructs: (1) The first level is job crafting orientation (approach crafting vs. avoidance crafting); (2) The second level is job crafting form (behavioural crafting vs. cognitive crafting); (3) The third level is job crafting content (job resources vs. job demands). The three job crafting hierarchical levels are combined together ($2 \times 2 \times 2$) to define eight types of job crafting. However, the results of such approaches are not always consistent or show considerable overlap. This study therefore aims to provide a comprehensive understanding of the divergent job crafting perspectives and to clarify the operational concept of job crafting.

To this end, five distinct taxonomies of job crafting measures (i.e., the JCS, JCM, JCQ, CJCS, and OJCS; see Table 1) were used to test the hypotheses, to compare and contrast specific similarities and differences of their job crafting propositions, by investigating their interplay in predicting meaningful work outcomes (i.e., work engagement and innovation behaviour). The five taxonomies have in common that they all focus on self-initiated meaningful work changes while highlighting different aspects of job crafting. The JCQ focuses on the three constructs of cognitive crafting, task crafting and relational crafting (Slemp & Vella-Brodrick, 2013). The JCS focuses on job characteristics from an approach versus avoidance behaviour perspective and does not include the cognitive dimension of job crafting (Tims et al., 2012). Avoidance behaviour in the JCS (i.e., JCS-decreasing) serves as "a health-protecting coping mechanism" (Demerouti, 2014, p. 239), by reducing excessively high demands (e.g., "I make sure that my work is mentally less intense") to prevent worse negative health outcomes. The JCM includes the cognitive dimension of job crafting and further distinguishes between behaviour crafting in terms of the expansion and contraction of work boundaries (Weseler & Niessen, 2016). Avoidance behaviour in the JCM (i.e., JCM-reducing) emphasizes motivational states related to "role-breadth", by shrinking work scopes (e.g., "I pass on tasks that do not really suit me so that the job I do suits me") to distance themselves from implied role boundaries. The CJCS includes a specific component facet whereby individuals take actions to alter the structure of tasks (Bizzi, 2017). The OJCS focuses on the

underlying psychological energy mechanisms (i.e., meaningfulness) that matter to behaviour crafting in general, instead of on specific job crafting behaviours.

We conduct an exploratory factor analysis (EFA) of these relationships to explore the inner component features among the five job crafting measures and consider the incremental validity of the integrated subscales by examining their associations with meaningful criterion variables (work engagement and innovation behaviour) using hierarchical multiple regression analysis (HMRA). We additionally offer a series of confirmatory factor analyses (CFA), examining whether the captured job crafting dimensions in an integrated model yield substantially different conclusions regarding such effects. In doing so, we develop a better understanding of the multiple-lens perspectives to address the issue of how the job crafting propositions can be made more precise.

Overall contributions

This study enhances understanding of the nature of job crafting by clarifying the blurred, overlapping, and inconsistent zones of job crafting conceptualizations represented by five distinct job crafting measures and their conceptual propositions. Such a conceptual clarification is important because it facilitates the possible resolution at the conceptual level in building viable theories concerning topics common to different job crafting taxonomies and propositions, that incorporates the cognitive-behaviour perspective, the role identities-job characteristics perspective, and the approach-avoidance perspective of job crafting. Furthermore, this study not only provides empirical evidence for specific theoretical propositions raised in the job crafting literature, such as that hindering demands can be crafted in an approach-oriented way (Zhang & Parker, 2019), and that cognitive crafting and behavioural crafting are probably reciprocally related (Tims et al., 2012). It also facilitates a more comprehensive portrayal of job crafting across the measures and taxonomies of job crafting, allowing us to explore possibilities for bridging different concept boundaries, which may lead to the development of parsimonious job crafting theories and measures.

Method

Data sample

Sample 1

The study was conducted in a group of medical volunteers in Zhejiang Province in China. These volunteers came from various hospitals in Yongkang city. Cross-sectional data were obtained from 162 health professionals via an online survey in February 2018. Prior to the study, permission was obtained from the group leader, and the participants were informed about the purpose and meaning of the survey. Participants received an invitation letter and an online hyperlink to the questionnaires, via the WeChat website (the Chinese equivalent of Facebook). The sample comprised 23 doctors, 115 nurses, and 24 medical technicians (M age = 34.21, SD = 7.75; M tenure = 8.96 years, SD = 6.23), and included 148 females (91.4%) and 14 males (8.6%).

Sample 2

The study was conducted in 2017 as part of a collaborative research project that primarily focused on employees' work engagement and innovation behaviour in the Chinese Zotye Automobile Company. Permission to conduct the study was obtained from the HR office and the survey content was discussed with an HR employee who was responsible for this project. The data were collected in two waves with a six-month interval, as suggested by Dormann and Griffin (2015). At Time 1 (T1), a field study was conducted in 50 teams of this company. From each team, five participants were randomly picked and asked to complete a paper-and-pencil questionnaire. An accompanying letter introduced the goal of the study and emphasized the confidentiality of the participants' answers. A total of 202 employees returned a completed questionnaire to the researcher directly, yielding an 81% response rate. At Time 2 (T2), an electronic questionnaire was sent to the email addresses covering all R&D employees (n = 1509), which resulted in a 45% response rate (n = 681). The T1 and T2 data were matched by employee job number, yielding a two-wave sample of 130 employees (M age = 31.01, SD = 3.79; M tenure = 3.32, SD = 1.78) that included 22 females (16.9%) and 108 males (83.1%). The five job crafting scales were measured at T1. Work engagement and innovation behaviour were measured at T1 and T2.

Measures

Five job crafting measures were translated from English into Chinese by two native Chinese-speaking master's degree students and one associate professor in psychology, working independently from each other. Semantic differences in translations were discussed and a common translation was agreed upon. The final questionnaire was back-translated and checked by an associate professor in English teaching, and discrepancies were resolved through consensus. The five crafting measures were:

Dutch Job Crafting Scale (JCS)

The 21-item JCS encompasses four dimensions (Tims et al., 2012): increasing structural resources (5 items, e.g., "I try to learn new things at work"), increasing social resources (5 items, e.g., "I ask others for feedback on my job performance"), increasing challenging demands (5 items, e.g., "When there is not much to do at work, I see it as a chance to start new projects"), and decreasing hindering demands (6 items, e.g., "I make sure that my work is mentally less intense"). Participants responded to these statements on a five-point Likert scale (1 = "never", 5 = "always"). A second-order confirmatory factor analysis using four latent factors with item indicators showed acceptable fit of the measurement model for both health professionals (χ^2 (df = 134) = 226.73, NFI = .90, TLI = .94, CFI = .96, $RMSEA$ = .05) and R & D employees (χ^2 (df = 134) = 206.25, NFI = .90, TLI = .94, CFI = .96, $RMSEA$ = .05).

Job Crafting Questionnaire (JCQ)

The JCQ (Slemp & Vella-Brodrick, 2013) consists of 15 items that cover three dimensions. Task crafting is measured using five items, including "Introduce new approaches to improve my

work.” Relation crafting contains five items but one of these, “organize special events in the workplace (e.g., celebrating a coworker’s birthday)”, was removed due to low reliability. An example item is: “Make an effort to get to know people well at work.” Cognitive crafting also contains five items, such as “Think about how my job gives my life purpose.” Participants were instructed to indicate the extent to which they engaged in each crafting using a Likert-type scale (1 = “never”, 5 = “always”). A second-order confirmatory factor analysis using three latent factors with item indicators showed acceptable fit of the measurement model for both health professionals (χ^2 (df = 59) = 145.35, NFI = .91, TLI = .91, CFI = .94, RMSEA = .09) and R & D employees (χ^2 (df = 59) = 121.89, NFI = .91, TLI = .92, CFI = .95, RMSEA = .07).

Job Crafting Measure (JCM)

The JCM (Weseler & Niessen, 2016) assesses cognitive crafting and the extension and reduction of task and relational boundaries at work. All items started with “So that the job I do suits me, [...]” Crafting of task boundaries included extending tasks (3 items, e.g., “I concentrate on specific tasks”) and reducing tasks (3 items, e.g., “I pass on tasks that do not really suit me”). Crafting of relational boundaries included extending relationships (2 items, e.g., “I invest in relationships with people whom I get along with the best”) and reducing relationships (3 items, e.g., “I try to avoid contact with the people at work whom I do not really get on well with”). Finally, cognitive crafting consisted of three items, including “I find personal meaning in my tasks and responsibilities at work.” Responses were given on a five-point Likert-type scale (1 = “never”, 5 = “always”). A second-order confirmatory factor analysis using five latent factors with item indicators showed acceptable fit of the measurement model for both health professionals (χ^2 (df = 69) = 123.74, NFI = .92, TLI = .95, CFI = .96, RMSEA = .07) and R & D employees (χ^2 (df = 69) = 105.97, NFI = .91, TLI = .96, CFI = .97, RMSEA = .05).

Overarching Job Crafting Scale (OJCS)

The OJCS (4 items) emphasizes the changes employees make in their job to optimize their functioning in terms of well-being, work-related attitudes or behaviour (Hu et al., 2019; Vanbelle, 2017). An example item is: “I make changes in my job to feel better” (1 = “never”, 5 = “always”).

Combined Job Crafting Scale (CJCS)

The combined job crafting scale (Bizzi, 2017) is a revised version of Leana et al.’s (2009) Job Crafting Scale. The scale provides a global score for the behavioural aspect of crafting jobs, whereby individuals take concrete actions to alter the structure of tasks. Due to low reliability, the item “I changed on my own how my job was executed to be more effective” was removed. An example item is: “on my own, I eliminated redundant or unnecessary tasks” (1 = “never”, 5 = “always”).

Work engagement was measured with the Utrecht Work Engagement Scale (UWES; Schaufeli et al., 2006). The scale consists of three dimensions: vigour (VI, 3 items), dedication (DE, 3 items), and absorption (AB, 3 items). Example items are “At my work, I feel bursting with energy” (vigour), “I am enthusiastic about my job” (dedication), and “I am immersed in my work” (absorption), with responses ranging from 1 (“never”) to

5 (“always”). A second-order confirmatory factor analysis using three latent factors with item indicators showed acceptable fit of the measurement model for both health professionals (χ^2 (df = 20) = 57.53, NFI = .97, TLI = .96, CFI = .98, RMSEA = .08) and R & D employees at T1 (χ^2 (df = 20) = 42.42, NFI = .95, TLI = .95, CFI = .97, RMSEA = .09) and T2 (χ^2 (df = 20) = 49.90, NFI = .95, TLI = .95, CFI = .97, RMSEA = .10).

Innovation behaviour was measured with the 9-item Innovation Work Behaviour Scale (IWB; Janssen, 2000). The items measure the global extent to which employees engage in innovative work behaviours, such as “creating new ideas for difficult issues” (1 = “never”, 5 = “always”). A higher score indicates a higher level of innovative work behaviour.

Statistical analyses

Sample 2 was potentially nested, members within groups, but we ruled out using hierarchical linear modelling since most teams were cross-functional, teams had few members at Time 2, and the ICCs in the outcomes were small. To examine Hypothesis 1a that the component construct of job crafting is mainly consistent with approach job crafting behaviour we used exploratory factor analysis (EFA) to explore whether there was a latent “approach” construct among all job crafting scales or subscales. Further, using multiple regression analysis we assessed the component validity of the five job crafting measures, and approach job crafting and avoidance job crafting in relation to work outcomes (work engagement and innovation behaviour).

To assess Hypothesis 1b that active coping behaviour can be distinguished from withdrawal behaviour in predicting work outcomes, we used hierarchical multiple regression analysis (HMRA), and assessed the incremental validity of each crafting aspect, by examining the unique variance accounted for in work engagement and innovation behaviour as the criterion variables.

To assess Hypothesis 2 that job characteristics crafting partly overlaps with role identity crafting in predicting work outcomes (work engagement and innovation behaviour), we used HMRA and assessed the incremental validity of job characteristics crafting (represented by the JCS) versus role identities crafting (represented by the JCM-extending) in explaining work outcomes.

To assess Hypothesis 3 that behaviour crafting is positively interlinked with cognitive crafting in predicting work outcomes, we used HMRA with work engagement and innovation behaviour as the criteria, to test the incremental validity of behaviour vs cognitive crafting. When conducting hierarchical analyses, we also reversed the order to provide a fair comparison of incremental effects. The IBM SPSS 25 computer program was used to analyse the data. Given our interest in the specific incremental contributions of single scales, the change in the proportion of variability explained for each criterion (ΔR^2_{adj}) was examined.

Although HMRA is the norm for estimating the strength of the relationship between measures (Cortina et al., 2017), we undertook a more stringent methodological choice, to tease out the conceptual distinctiveness of the crafting constructs by also running a confirmatory factor analysis (CFA). To provide

additional evidence for the distinctiveness of competing crafting concepts in Hypothesis 1, 2, 3 we used confirmatory factor analysis (CFA) with maximum likelihood estimation using the IBM Amos 25 computer program. In addition to the χ^2 statistic, we report the Nonnormed Fit Index (NFI), the Comparative Fit Index (CFI), the Tucker–Lewis Index (TLI), and the Root Mean Square Error of Approximation (RMSEA). For models with more than 20 variables, it is very unlikely to find a well-fitting model (Bentler & Chou, 1987). Therefore, we concentrate on the χ^2 -difference test when comparing the fit of nested models.

Results

Preliminary analyses

Table 2 provides the means, standard deviations, reliabilities (Cronbach's alpha), and Pearson correlations for the study variables. The reliabilities of most subscales exceeded .70 in both samples except *extending tasks* (.61) and *extending relations* (.55) in the JCM among R&D employees.

Job crafting components

Hypothesis 1a proposed that job crafting is mainly consistent with approach job crafting behaviour. We used principal factor analysis (maximum likelihood) with oblique rotation to explore the latent component of five job crafting scales or subscales. Factor analyses using direct oblimin rotation were conducted for the total sample (i.e., health professionals and R&D employees at T1, $N = 364$) as well as for the separate samples (health professionals, $N = 162$, and R&D employees at T1, $N = 202$), respectively. We retained factors with Eigenvalues > 1 . Two factors were extracted for the total sample ($N = 364$) and the health professionals ($N = 162$); the four subscales of the JCS and the three subscales of the JCQ, OJCS, and CJCS loaded on the first factor, while *reducing tasks*, *reducing relations*, and *extending relations* ($= .30$ and $.32$) of the JCM loaded on the second factor.

In the R&D sample, three factors were extracted but given the vague cross-loadings and weak eigenvalue (1.02) of the third factor, a two-factor solution was forced for this sample. The results showed a clear structure (see Table 3 for the final results), in which all job crafting subscales loaded on one of these two factors (i.e., no cross-loadings except *reducing tasks* and *reducing relations* of the JCM). The first factor, approach job crafting, accounted for 48.26%, 52.89%, and 44.25% of the total variance in the total sample, among health professionals, and among R&D employees, respectively. The second factor, withdrawal behaviour, captures the proactive “active” element accounted for 9.81%, 10.51%, and 9.19% of the total variance in these three samples. Hypothesis 1a is therefore largely supported; job crafting behaviour is mainly composed of approach-promoting behaviour and active coping behaviour.

Hypothesis 1b proposed that active coping behaviour is distinguished from withdrawal behaviour in predicting work engagement and innovation behaviour. We used regression analysis (see Table 4), with the component constructs of each job crafting measure as the predictors, to test the effects of (1) all job crafting measures; (2) approach-promoting behaviour

(represented by the *JCS-increasing* and *JCM-extending*) and avoidance behaviour (represented by the *JCS-decreasing* and *JCM-reducing*); and (3) active coping behaviour (i.e., *JCS-decreasing*) and withdrawal behaviour (i.e., *JCM-reducing*), on work engagement and innovation behaviour. Considering the different number of subscales of each questionnaire, adjusted multiple regression coefficients (R^2_{adj}) were used to compare concurrent criterion validity among measures.

As shown in Table 4, there was some variation in the amount of explained variance (R^2_{adj}) in the focal outcomes across the two samples. Among health professionals, the five job crafting measures overall explained a significant part of the variance (R^2_{adj} ranged from .28 to .47) in work engagement and innovation behaviour. The same applied to work engagement and innovation behaviour at T1 among R&D employees (R^2_{adj} ranged from .13 to .47), but for work engagement and innovation behaviour at T2 the effects were much smaller (R^2_{adj} ranged from .02 to .16). As a specific measure, the JCS appeared to be a superior predictor, as compared to the other job crafting measures among R&D employees (Mean $R^2_{adj} = .29$). The predictive strength of “approach-promoting” work behaviour (*JCS-increasing* and *JCM-extending*) was stronger than that of avoidance behaviour (*JCS-decreasing* and *JCM-reducing*) among health professionals and R&D employees. These results (Table 4) provide preliminary support for Hypothesis 1b.

Incremental validity of active coping behaviour versus withdrawal behaviour

The distinction between active coping behaviour (represented by *JCS-decreasing*) and withdrawal behaviour (represented by *JCM-reducing*) was checked further by HMRA (see Table 5). *JCS-decreasing* showed salient predictive power to work engagement and innovation behaviour over *JCM-reducing*. Although the *JCM-reducing* strategy showed relatively small (but significant) correlations with work engagement and innovation behaviour among health professionals, after controlling for the effect of *JCS-decreasing* on work engagement and innovation behaviour, the effects of *JCM-reducing* disappeared (all $R^2_{adj} < .02$, *ns*). In conjunction with the factor-analytical results that *JCS-decreasing* neatly loaded on the first factor with “approach-promoting” job crafting scales and subscales across all samples (see Table 3). This finding supports Hypothesis 1b; active coping behaviour (in the form of *JCS-decreasing*) can be distinguished from withdrawal behaviour (*JCM-reducing* which has passive withdrawal connotations).

Next, tests of Hypothesis 1a and 1b were replicated using CFA to promote methodological validation. Note that for the health professionals outcomes were *current* engagement and *current* innovation behaviour, while for the R&D employees outcomes were *current* as well as *future* engagement and innovation behaviour.

Four models were compared (see Table 8): (1) One-factor model (M_1 ; all scales and subscales of five job crafting measures load on one general factor); (2) Two-factor approach-withdrawal model (M_2 ; two indicators of *JCM-reducing* load on the withdrawal factor while *JCS-decreasing* and other subscales load on the approach crafting factor); (3) Two-factor approach-avoidance model (M_3 ; *JCS-decreasing* and two indicators of *JCM-reducing* load on the avoidance factor, while the other subscales load on

Table 2. Means (*M*), standard deviations (*SD*), internal consistencies, and correlations among health professionals (*N* = 162, lower half) and R&D employees (*N* = 130, upper half).

	Health professionals			R & D employees										
	Mean	SD		Mean	SD		1	2	3	4	5	6	7	8
1. Increasing structural resources_JCS	4.47	.65		4.58	.43		.90/.73	.33**	.43**	.16	.38**	.34**	.46**	.41**
2. Increasing social resources_JCS	4.07	.78		4.03	.70		.69**	.87/.80	.47**	.43**	.34**	.47**	.41**	.33**
3. Increasing challenging demands_JCS	4.15	.70		4.30	.59		.64**	.67**	.85/.80	.42**	.65**	.42**	.71**	.52**
4. Decreasing hindering demands_JCS	4.00	.77		3.88	.73		.33**	.39**	.38**	.88/.81	.44**	.38**	.44**	.26**
5. Task crafting_JCQ	3.98	.76		4.11	.60		.56**	.59**	.72**	.50**	.88/.73	.29**	.64**	.62**
6. Relational crafting_JCQ	4.31	.70		4.20	.78		.65**	.67**	.66**	.34**	.71**	.82/.68	.39**	.17
7. Cognitive crafting_JCQ	4.26	.76		4.29	.60		.59**	.62**	.72**	.48**	.68**	.73**	.92/.82	.57**
8. Extending tasks_JCM	4.30	.70		4.22	.60		.50**	.53**	.67**	.45**	.61**	.54**	.72**	.80/.61
9. Reducing tasks_JCM	3.34	1.06		3.17	1.01		.11	.12	.22**	.49**	.31**	.18*	.30**	.22*
10. Extending relations_JCM	4.39	.78		4.31	.67		.29**	.31**	.40**	.44**	.49**	.38**	.45**	.44**
11. Reducing relations_JCM	3.41	1.24		3.16	1.07		.05	.09	.13	.45**	.29**	.16*	.15	.20*
12. Cognitive crafting_JCM	4.20	.75		4.30	.61		.55**	.57**	.67**	.50**	.65**	.64**	.80**	.76**
13. OJCS	4.27	.73		4.30	.57		.42**	.45**	.55**	.56**	.62**	.58**	.73**	.68**
14. CJSC	4.00	.74		4.11	.55		.39**	.48**	.62**	.56**	.69**	.56**	.71**	.74**
15. Vigour (T1)	3.49	1.18		3.86	.90		.46**	.46**	.65**	.40**	.55**	.47**	.63**	.61**
16. Dedication (T1)	3.55	1.12		3.87	.93		.42**	.48**	.66**	.37**	.58**	.48**	.57**	.48**
17. Absorption (T1)	3.20	1.14		3.77	.95		.45**	.46**	.66**	.37**	.60**	.49**	.67**	.60**
18. IWB (T1)	4.47	.65		4.05	.76		.44**	.51**	.66**	.38**	.63**	.50**	.58**	.59**
19 Vigour (T2)				3.36	.92									
20 Dedication (T2)				3.27	.89									
21 Absorption (T2)				3.28	.90									
22 IWB (T2)				3.23	.67									
1. Increasing structural resources_JCS	-.10	.19*		.43**	.46**		.37**	.53**	.51**	.42**	.49**	.17	.23	.22
2. Increasing social resources_JCS	.23**	.19*	.18*	.33**	.36**		.39**	.48**	.49**	.47**	.52**	.27	.34	.21
3. Increasing challenging demands_JCS	.12	.25**	.14	.56**	.40**	.48**	.55**	.55**	.56**	.58**	.61**	.23	.30	.41
4. Decreasing hindering demands_JCS	.32**	.13	.38**	.37**	.28**	.37**	.35**	.33**	.34**	.35**	.33**	.09	.13	.09
5. Task crafting_JCQ	.26**	.26**	.22*	.51**	.53**	.51**	.58**	.51**	.50**	.48**	.55**	.27	.26	.29
6. Relational crafting_JCQ	.03	.00	.04	.31**	.26**	.20*	.20*	.30**	.33**	.28**	.40**	.08	.13	.14
7. Cognitive crafting_JCQ	.07	.32**	.14	.68**	.57**	.66**	.60**	.62**	.59**	.54**	.66**	.32	.36	.36
8. Extending tasks_JCM	.24**	.46**	.26**	.48**	.53**	.60**	.40**	.40**	.44**	.37**	.47**	.28	.26	.19
9. Reducing tasks_JCM	.84/.82	.35**	.61**	.07	.14	.24**	.24**	-.01	-.03	.03	.07	.18	-.08	.04
10. Extending relations_JCM	.49**	.79/.55	.39**	.26**	.37**	.38**	.38**	.16	.15	.09	.21*	.20*	.15	.23**
11. Reducing relations_JCM	.63**	.47**	.39**	.17	.22*	.25**	.25**	-.02	.01	-.02	.08	.09	-.10	-.06
12. Cognitive crafting_JCM	.35**	.52**	.26**	.86/.73	.48**	.48**	.48**	.49**	.39**	.44**	.47**	.24**	.22*	.26**
13. OJCS	.44**	.56**	.39**	.78**	.91/.78	.61**	.61**	.32**	.39**	.33**	.47**	.22*	.13	.18*
14. CJSC	.51**	.59**	.45**	.78**	.80**	.80**	.89/.77	.44**	.43**	.43**	.56**	.30**	.27**	.30**
15. Vigour (T1)	.24**	.23**	.12	.62**	.53**	.60**	.60**	.87**	.81**	.81**	.68**	.43**	.49**	.38**
16. Dedication (T1)	.25**	.23**	.16*	.62**	.53**	.60**	.60**	.93**	.93/.87	.86**	.75**	.38**	.42**	.43**
17. Absorption (T1)	.26**	.28**	.11	.66**	.56**	.60**	.60**	.89**	.90**	.91/.81	.60**	.41**	.43**	.36**
18. IWB (T1)	.30**	.29**	.27**	.66**	.53**	.63**	.63**	.78**	.81**	.78**	.98/.94	.25**	.36**	.45**
19 Vigour (T2)											-.84	.82**	.84**	.37**
20 Dedication (T2)											-.87	.82**	.86**	.36**
21 Absorption (T2)												-.87	.84**	.43**
22 IWB (T2)													-.84	-.92

Note: **p* < .05, ***p* < .01, ****p* < .001; Cronbach's α on the diagonal.

Table 3. Rotated factor loadings of the subscales of five job crafting scales among total sample (N = 364), and among separate samples health professionals (N = 162) and R&D employees in Time 1 (N = 202).

	Total		Health Professionals		R&D Employees	
	Factor 1 (Approach crafting)	Factor 2 (Withdrawal)	Factor 1 (Approach crafting)	Factor 2 (Withdrawal)	Factor 1 (Approach crafting)	Factor 2 (Withdrawal)
Cognitive crafting _JCQ	.86		.87		.84	
Cognitive crafting _JCM	.82		.88		.75	
CJCS	.80		.87		.72	
Task crafting _JCQ	.79		.80		.79	
Increasing challenging demands _JCS	.78		.79		.76	
Extending tasks _JCM	.77		.81		.75	
OJCS	.76		.84		.68	
Increasing social resources _JCS	.66		.68	-.39	.65	
Relational crafting _JCQ	.66		.76	-.30	.58	
Decreasing hindering demands _JCS	.63		.61	-.43	.67	
Increasing structural resources _JCS	.62		.63		.60	
Extending relations _JCM	.57	.30	.60	.32	.54	
Reducing relations _JCM	.38	.73	.35	.59	.41	.74
Reducing tasks _JCM	.43	.63	.43	.55	.44	.63
Eigenvalues	7.17	1.78	7.76	1.95	6.66	1.68
Explained variance	48.26%	9.81%	52.89%	10.51%	44.25%	9.19%

Notes: Only factor loadings >.30 are depicted. Factor loadings are significant at $p > .05$.

Table 4. Relationships between crafting, work engagement, and innovation: Adjusted squared multiple correlation coefficients (R^2_{adj}) for five job crafting measures among health professionals (N = 162) and R&D employees (N = 130).

	k	Health Professionals		R&D Employees			
		Work engagement	Innovation behaviour	Work engagement (T1)	Work engagement (T2)	Innovation behaviour (T1)	Innovation behaviour (T2)
Component constructs loaded on the first factor							
JCS	4	.47***	.44***	.45***	.09**	.47***	.16***
JCQ	3	.47***	.44***	.40***	.09**	.43***	.12***
JCM	5	.47***	.47***	.29***	.08**	.28***	.10**
OJCS	1	.31***	.28***	.13***	.02	.22***	.02*
CJCS	1	.39***	.39***	.20***	.07**	.31***	.09***
Behaviour component – Approach-promoting behaviour							
JCS – increasing	3	.46***	.44***	.45***	.09**	.47***	.15***
JCM – extending	2	.37***	.34***	.17***	.05*	.21***	.03*
Behaviour component – Avoidance behaviour							
JCS – decreasing (active coping)	1	.15***	.14***	.12***	.00	.10***	.00
JCM – reducing (withdrawal)	2	.06**	.09***	−.02	−.01	−.01	−.00

Note: k = number of scale composites; * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 5. Adjusted squared multiple correlation coefficients (R^2_{adj}) with active coping behaviour and withdrawal behaviour.

	k	Health Professionals (N = 162)		R&D Employees (N = 130)			
		Work engagement	Innovation behaviour	Work engagement (T1)	Work engagement (T2)	Innovation behaviour (T1)	Innovation behaviour (T2)
Step 1 Active coping (JCS – decreasing): R^2_{adj}	1	.15***	.14***	.12***	.00	.10***	.00
Step 2 Withdrawal (JCM – reducing): ΔR^2_{adj}	2	.01	.01	.02	.02	.00	.02
Step 1 Withdrawal (JCM – reducing): R^2_{adj}	2	.06**	.09***	-.02	-.01	-.01	-.00
Step 2 Active coping (JCS – decreasing): ΔR^2_{adj}	1	.10***	.06**	.16***	.02	.10***	.01
Overall F		10.87***	10.25***	7.74***	1.38	5.19**	1.18

Note: k = number of scale composites. * $p < .05$, ** $p < .01$, *** $p < .001$.

the approach crafting factor); (4) Two-factor cross-loading model (M_4 ; two indicators of JCM-reducing load on the withdrawal factor while JCS-decreasing crossloads on both the withdrawal factor and the approach crafting factor). The results revealed that M_2 had a lower χ^2 than M_3 among health professionals and R&D employees, while M_4 had a better fit than M_2 and M_3 . The path coefficients in M_4 linking the withdrawal and approach crafting factors to JCS-decreasing were positive and significant among both health professionals ($\beta = .43$ and $.40$, $p < .001$) and R&D employees ($\beta = .32$ and $.42$, $p < .001$). JCS-decreasing therefore appears to contain the positive element of “approach” job crafting and may even be considered active coping behaviour. This provides additional

support to Hypothesis 1a that approach job crafting mainly consists of approach-promoting behaviour and active coping behaviour. In addition, all path coefficients linking the approach crafting factor to current or/and future engagement and innovation behaviour were positive and significant ($p < .001$) among both health professionals and R&D employees, while the path coefficients linking the withdrawal factor to engagement and innovation behaviour were nonsignificant or negative (i.e., the paths from withdrawal factor to current and future work engagement among R&D employees were $\beta = -.23$ and $-.22$, $p < .05$, respectively). The path analysis results of the two-factor cross-loading model (M_4) match with the correlations in Table 2. Thus,

in support of Hypothesis 1b, withdrawal behaviour can be distinguished from active coping behaviour (i.e., approach job crafting) with respect to work engagement and innovation behaviour.

Incremental validity of job characteristics crafting versus role identities crafting and incremental validity of behaviour crafting versus cognitive crafting.

Hypothesis 2 proposed that job characteristics crafting partly overlaps with role identity crafting in predicting work engagement and innovation behaviour.

We used HMRA to examine the incremental validity of job characteristics crafting vs. role identities crafting (Table 6) and behaviour crafting vs. cognitive crafting (Table 7). The incremental effect of role identities crafting (i.e., the extension and reduction of task and relational boundaries of the JCM) beyond that of job characteristics crafting (i.e., the JCS) was explored by entering four subscales of the JCS in Step 1. At Step 2, we entered the extension and reduction of task and relational boundaries of the JCM. To examine possible order effects, we reversed Steps 1 and 2. Controlling the effect of job characteristics crafting in Step 1, role identities crafting accounted for a weak or nonsignificant part of the variance over job characteristics crafting among health professionals (average $\Delta R^2_{adj} = .07$) and R&D employees (average $\Delta R^2_{adj} = .04$). Reversing the order of entering these job crafting scales, job characteristics crafting showed superior significant effects over role identities crafting on work engagement and innovation behaviour among health professionals (average $\Delta R^2_{adj} = .14$) and R&D employees (average $\Delta R^2_{adj} = .20$). Hypothesis 2 is supported: Job characteristics crafting accommodates role identity crafting.

An additional test of Hypothesis 2 was conducted using CFA. Three models were assessed: (1) A one-factor model (M_5) that assumes all subscales of role identities crafting and work characteristics crafting load on one factor; (2) A two-factor model (M_6) that assumes two correlated latent variables, corresponding with role identities crafting and work characteristics crafting, respectively. The fit of M_6 was superior to that of M_5 among R&D employees ($\Delta\chi^2 (\Delta df = 5) = 24.67, p < .01$; see Table 8), while M_6 appeared to have poor discriminant validity with M_5 among health professionals ($\Delta\chi^2 (\Delta df = 3) = 8.31, ns$). In the one-factor model M_5 , path coefficients linking the general factor to *current* engagement and innovation behaviour or/and *future* engagement and innovation behaviour were positive and significant ($p < .001$) among both health professionals and R&D employees. In the two-factor model M_6 , the path coefficients linking job characteristics crafting to *current* engagement and innovation behaviour were significant among health professionals ($\beta = .52$ and $.51, p < .01$) while the path coefficient linking job characteristics crafting to *future* engagement was significant among R&D employees ($\beta = .67, p < .001$). All path coefficients linking role identities crafting to engagement and innovation behaviour were nonsignificant among health professionals and R&D employees. The component validity of the job characteristics crafting measure versus the role identities crafting measure was checked by constraining the effects of its counterpart on outcomes. Restricting the effects of job characteristics crafting on *current/future* engagement and on *current/future* innovation behaviour in M_6 , all path coefficients linking role identities crafting to *current/future*

Table 6. Adjusted squared multiple correlation coefficients (R^2_{adj}) with job characteristics crafting and role identity crafting.

	<i>k</i>	Health Professionals (<i>N</i> = 162)		R&D Employees (<i>N</i> = 130)			
		Work engagement	Innovation behaviour	Work engagement (T1)	Work engagement (T2)	Innovation behaviour (T1)	Innovation behaviour (T2)
Step 1 job characteristics crafting (JCS): R^2_{adj}	4	.47***	.44***	.45***	.09**	.47***	.16***
Step 2 role identities crafting (JCM): ΔR^2_{adj}	4	.06***	.08***	.03	.06	.01	.05
Step 1 role identities crafting (JCM): R^2_{adj}	4	.39***	.37***	.18***	.08**	.20***	.06*
Step 2 job characteristics crafting (JCS): ΔR^2_{adj}	4	.14***	.14***	.30***	.07	.27***	.14***
Overall <i>F</i>		22.70***	21.35***	14.92***	3.11**	14.90***	4.64***

Note: *k* = number of scale composites. * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 7. Adjusted squared multiple correlation coefficients (R^2_{adj}) with behaviour crafting and cognitive crafting.

	<i>k</i>	Health Professionals (<i>N</i> = 162)		R&D Employees (<i>N</i> = 130)			
		Work engagement	Innovation behaviour	Work engagement (T1)	Work engagement (T2)	Innovation behaviour (T1)	Innovation behaviour (T2)
Step 1 JCQ (behaviour crafting): R^2_{adj}	2	.36***	.40***	.29***	.06*	.36***	.07**
Step 2 JCQ (cognitive crafting): ΔR^2_{adj}	1	.11***	.04**	.11***	.05*	.12***	.05**
Step 1 JCQ (cognitive crafting): ΔR^2_{adj}	1	.43***	.34***	.38***	.10***	.43***	.13***
Step 2 JCQ (behaviour crafting): R^2_{adj}	2	.05**	.11***	.03*	.00	.05**	.01
Overall <i>F</i>		49.10***	42.27***	30.01***	5.33**	39.64***	6.65***
Step 1 JCM (behaviour crafting): R^2_{adj}	4	.39***	.37***	.18***	.08**	.20***	.06*
Step 2 JCM(cognitive crafting): ΔR^2_{adj}	1	.09***	.10***	.11***	.01	.08***	.04*
Step 1 JCM(cognitive crafting): ΔR^2_{adj}	1	.43***	.43***	.24***	.04*	.22***	.06**
Step 2 JCM (behaviour crafting): R^2_{adj}	4	.06**	.05**	.07*	.07	.08**	.06
Overall <i>F</i>		29.99***	29.34***	11.52***	3.29**	10.92***	3.79**
Step 1 (behaviour crafting #): R^2_{adj}	12	.47***	.54***	.48***	.12**	.51***	.18***
Step 2 (Cognitive crafting): ΔR^2_{adj}	2	.02*	.03**	.04*	.02	.03*	.01
Step 1 (Cognitive crafting): ΔR^2_{adj}	2	.48***	.44***	.38***	.10**	.43***	.12***
Step 2 (behaviour crafting #): R^2_{adj}	12	.12***	.16***	.17***	.10	.14***	.13
Overall <i>F</i>		16.21***	17.28***	10.46***	2.21*	12.03***	3.17***

Note: # = Twelve subscales including four subscales of JCS, two subscales of JCQ, four subscales of JCM, CJCS, and OJCS; *k* = number of scale composites. * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 8. Goodness-of-Fit Indices among health professionals ($N = 162$) and R&D employees ($N = 130$).

Model	Health professionals ($N = 162$)						R&D employees ($N = 130$)					
	χ^2	df	NFI	CFI	TLI	RMSEA	χ^2	df	NFI	CFI	TLI	RMSEA
H1a: Job crafting is mainly consistent with approach-promoting behaviour and active coping behaviour; H1b: Active coping behaviour is distinguished from withdrawal behaviour												
M1 (one-factor model)	517.64	133	.81	.85	.83	.13	412.65	201	.79	.88	.86	.09
M2 (two-factor approach-withdrawal model)	447.28	130	.84	.88	.86	.12	345.40	196	.83	.92	.90	.08
M3 (two-factor approach-avoidance model)	448.87	130	.84	.88	.86	.12	356.07	196	.82	.91	.89	.08
M4 (two-factor cross-loading model)	421.36	129	.85	.89	.87	.12	331.99	195	.84	.92	.91	.07
H2: Job characteristics crafting overlaps with role identities crafting												
M5 (one-factor model)	70.98	33	.95	.97	.96	.09	121.64	69	.90	.95	.94	.08
M6 (two-factor model)	62.67	30	.95	.97	.96	.08	96.97	64	.94	.98	.97	.06
H3: Behaviour crafting interplays with cognitive crafting												
M7 (one-factor model)	335.02	102	.87	.90	.89	.12	274.59	162	.85	.93	.92	.07
M8 (two-factor model)	331.11	99	.87	.90	.88	.12	266.54	157	.86	.93	.92	.07

Note: *Current* work engagement and *current* innovation work behaviour were outcome variables in health professionals, while *current* work engagement and *current* innovation work behaviour and *future* work engagement and *future* innovation work behaviour were outcome variables in R&D employees. χ^2 = chi-square, df = degrees of freedom; NFI = normed fit index; CFI = comparative fit index; TLI = Tucker–Lewis index; RMSEA = root mean square error of approximation.

engagement and *current/future* innovation behaviour were significantly positive in both samples.

These results show that job characteristics crafting has stronger predictive effects than role identity crafting for engagement and innovation behaviour, and that job characteristics crafting is mixed with the role identities crafting component. Hypothesis 2, proposing that job characteristics crafting overlaps with role identity crafting, was largely supported, especially among health professionals.

Hypothesis 3 proposed that behaviour crafting partly overlaps with cognitive crafting in predicting work engagement and innovation behaviour. The incremental validity of cognitive crafting beyond behaviour crafting (i.e., task crafting and relational crafting) was explored by entering behaviour crafting at Step 1 and cognitive crafting at Step 2. Again, we also reversed the order of steps to compare incremental effects. As shown in Table 7, both *cognitive crafting* in JCQ and *cognitive crafting* in JCM accounted for a significant unique part of the variance in all criteria. However, these incremental effects disappeared or became less significant when all 12 subscales of behaviour crafting (see Table 3) were included as predictors. When reversing the order, the incremental effects of behaviour crafting were still most important in accounting for work engagement and innovation behaviour. The results suggest that behaviour crafting largely encompasses the cognitive component of job crafting supporting Hypothesis 3.

The discriminant validity of cognitive crafting and behaviour crafting was checked again by CFA analysis to compare the fit of a one-factor model (M_7 ; all subscales including behaviour crafting and cognitive crafting load on one general factor) and a two-factor model (M_8 ; this model assumes two correlated latent variables behaviour crafting and cognitive crafting). The non-significant χ^2 difference between M_7 and M_8 among health professionals ($\Delta\chi^2$ ($\Delta df = 3$) = 3.91, *ns*) and R&D employees ($\Delta\chi^2$ ($\Delta df = 5$) = 8.05, *ns*) revealed a poor discriminant validity for cognitive crafting versus behaviour crafting (Table 8). In the one-factor model M_7 , the path coefficients linking the general factor to *current* as well as *future* engagement and innovation behaviour were positive ($p < .001$) in both samples. In the two-factor model M_8 , nearly all path coefficients linking cognitive crafting/behaviour crafting to *current* and/or *future* engagement and

innovation behaviour were nonsignificant for both samples. Only the path from behaviour crafting to *current* innovation behaviour was positive among R&D employees ($\beta = .64$, $p < .05$). Next, we checked the component effect of behaviour crafting and cognitive crafting on outcomes, respectively. Restricting the effect of behaviour crafting on *current/future* engagement and innovation behaviour in M_8 , all path coefficients linking cognitive crafting to *current/future* engagement and innovation behaviour became positive and significant among health professionals and R&D employees, and vice versa. The CFA results showed the integrated job crafting with behaviour crafting and cognitive crafting has stronger predictive effects than the separated crafting for engagement and innovation behaviour. Consistent with Hypothesis 3, behaviour crafting is positively interlinked with cognitive crafting in predicting meaningful work outcomes.

Discussion

In recent years, researchers have provided conceptual syntheses and integrations of multiple perspectives on job crafting behaviour. Although this could enhance our understanding of this complex phenomenon, these syntheses are sometimes very similar, overlap, or are inconsistent with each other. Drawing upon the component and incremental validity of five distinct job crafting measures and their theoretical propositions in predicting work engagement and innovation behaviour, this study clarified blurred conceptualizations of job crafting and enhanced our understanding of how theoretical propositions on job crafting can be made with more confidence and precision.

Approach job crafting and avoidance job crafting

Our study revealed that approach-promoting behaviour (i.e., increasing and extending crafting behaviour) showed larger effects on work engagement and innovation behaviour than avoidance behaviour (i.e., decreasing and reducing behaviour). Possibly, approach-promoting behaviour strives towards congruence with the work environment, thus promoting positive attitudes towards work challenges and fostering enthusiasm and innovative thinking. Conversely, avoidance-focused job crafting

aims to conserve existing psychological energy in order to avoid further energy drain. That is, this type of behaviour is likely to reduce potential access to sources of positive reinforcement that is manifested in lower levels of engagement and innovative behaviour.

Further, our study found that the management of hindrance demands (*JCS-decreasing*) contains an underlying component that differs from the contraction of role identities (*JCM-reducing*), such as *JCS-decreasing* positively cross-loads on the approach crafting factor in CFA analysis, and that has a strong positive predictive power in relation to work engagement and innovation behaviour in multiple regression analysis. Apparently, whereas both avoiding behaviours aim to remove harmful stimuli, the former reflects promotion-focused health-protective behaviour which attempts to reduce stress by alleviating the problem (i.e., active coping). Conversely, the latter reflects prevention-focused behaviour which inhibits individuals to adjust healthily by distancing oneself from the problem (i.e., withdrawal). Using profile analysis, Mäkikangas (2018) revealed that in “active job crafters” who actively use multiple job crafting strategies simultaneously, the strategy of decreasing hindering job demands is less detrimental to work engagement (similar to the *JCS-decreasing* in our study, which has positive relations with approach crafting). In contrast, the passive job crafters who sought to decrease their hindering job demands but did not use other job crafting strategies reported relatively low work engagement. Thus, active management of hindrance demands is a more adaptive type of job crafting, in that individuals are likely to increase effort and engage in different behaviours to achieve their work goals. However, withdrawal management of hindrance demands is more maladaptive, in that individuals are likely to minimize taxing aspects of the job by shrinking their work role to decrease the effort they put into their job. As such, they are less likely to engage in adaptive and proactive behaviours to accomplish work goals.

Avoidance demands crafting has been assumed to be an effective strategy for employees to cope with excessive job demands and, as such, should be beneficial for well-being (Tims & Bakker, 2010). However, two meta-analyses revealed that avoidance work behaviour (i.e., decreasing hindering demands and prevention-focused job crafting) relates negatively to work engagement and positively to burnout (Lichtenthaler & Fischbach, 2019; Rudolph et al., 2017). In addition, studies using *JCS-decreasing* or similar scales (i.e., decreasing job demands, see Petrou et al., 2012) showed non-significant or negative relations with work engagement (Demerouti & Peeters, 2018). The reason is these studies did not further distinguish two sorts of avoidance motivation in coping work stress. Different events enable or disable different levels and forms of job crafting (Wrzesniewski & Dutton, 2001), but in each case, the goal of employees in altering their work is to facilitate psychological energy which would be associated with healthier functioning. Our study contributes to mounting evidence that these types of withdrawal behaviour (i.e., the contraction of role identities) are ineffective (Brown & Westbrook, 2005; Rippetoe & Rogers, 1987; Sirois & Kitner, 2015), and that it is probably better to focus on active coping behaviour (the optimization of hindrance demands). Therefore, we suggest that *effective* job crafting – i.e., crafting behaviour that matches the definition of job crafting as adaptive

behaviours that create a better person-job fit (Peeters et al., 2016; Tims et al., 2012; Wrzesniewski & Dutton, 2001) – mainly consists of approach-promoting work behaviour and active coping behaviour.

Job characteristics crafting and role identities crafting

Our study confirmed that role identities crafting and job characteristics crafting were strong predictors of work engagement and innovation behaviour (Table 6). Both role identities crafting and job characteristics crafting focus on the task and social changes of work, and bring about enjoyable and meaningful experiences. As such, they have a certain similarity in predicting work engagement and innovation behaviour. Our study found that role identities crafting overlapped with job characteristics crafting among health professionals, and that job characteristics crafting explained more variance in work engagement and innovation behaviour than role identities crafting (Table 6 and the CFAs). Possibly, having abundant job characteristics allows individuals greater flexibility in defining their work role as well as enables them to integrate more job aspects into their role, which is consistent with work design research that has demonstrated the motivational benefits of job characteristics (Hackman & Oldham, 1980; Hobfoll, 2002). Similarly, Parker (1998) and Morgeson et al. (2005) found that job characteristics (i.e., job autonomy and job control) increased role breadth. Bruning and Campion (2018) assumed that role identities crafting is the likely needs-driven motivational process as opposed to largely efficiency-focused changes in resources at work. Drawing on this assumption, they proposed that role crafting and job characteristics crafting (i.e., resource crafting) represent the ends of a single axis. However, our study revealed that the creation or composition of an individual's work role relates to the conduct of job-related activities. Work roles tend to be structured around occupational specialities in organizations, i.e., employees are largely known by their specific task roles and create more or less stable role identities in terms of their task characteristics and social interactions (Ilgen & Hollenbeck, 1991; Morgeson et al., 2005). Also, the meta-synthesis study of Lazazzara et al. (2020) revealed that job crafting is primarily motivated by the desire to control the work context and to perform well, rather than by the desire to improve oneself. The needs-driven motivation does not clearly distinguish the distinctions of role-based job crafting as proposed by Bruning and Campion (2018).

Tett and Burnett (2003) state that individuals' motivated work behaviour is driven by situational cues that mesh well with their personality traits. Role identities crafting emerges from the interaction of one's role profile with situational characteristics. Job characteristics provide the situational context in which job crafting behaviour is interpreted as being personally meaningful. Without the interpretative context provided by the task-related and social characteristics of jobs, it would be impossible for individuals to derive meaning from their purposeful strivings. Therefore, job characteristics are key in influencing the process of role identity creation, and job characteristics crafting plays a more fundamental role than role identities crafting in predicting work engagement and innovation behaviour.

Cognitive crafting and behaviour crafting

Some researchers argue that cognitive crafting is purely metacognitive crafting, without involving any behavioural changes (Bruning & Campion, 2018; Zhang & Parker, 2019). Metacognition is the ability to monitor and adapt own cognitive functions to affect own behaviour (Conn et al., 2018), including two distinct implications: metacognitive knowledge (i.e., what one knows about cognition) and metacognitive regulation (i.e., how one uses that knowledge to regulate cognition, Schraw & Moshman, 1995). Individuals construct their metacognition for two reasons: (a) to systematize their metacognitive knowledge; and (b) to understand and plan their own cognitive activities within a formalized framework (Schraw & Moshman, 1995). Our study revealed that cognitive crafting overlaps to some degree with behaviour crafting in predicting work engagement and innovation behaviour (cf. Table 7), suggesting that behaviour crafting and cognitive crafting are interrelated processes, perhaps because metacognition conveys a more general understanding of the action. People adopt certain standards of behaviour that serve as guides and motivators and that regulate their actions anticipatorily through self-reactive cognitive process (Bandura, 1991). In this sense, metacognition is reflected upon individuals' conscious thought about their work behaviour by monitoring and adapting one's behaviour to optimize the preferred outcome (Conn et al., 2018). When metacognition is changed, the cognitive aspects of the mind will change accordingly. Cognitive representations of action, such as "knowing other people" and "learning new things", function as guidance for behaviour crafting. Unexpectedly, our study found that whereas the behavioural factor consisted of 12 subscales, behaviour crafting and cognitive crafting collapsed into a single integrated factor. This suggests that existing measures, whether focusing on behaviour crafting or cognitive crafting, do not appropriately capture the unique meaning of these two types of job crafting, and perhaps need to be revised.

Five job crafting measures

Our study showed that the JCS had a relatively high predictive validity in relation to work engagement and innovation behaviour, while the OJCS and CJCS had a more moderate predictive validity regarding work engagement and innovation behaviour than the other narrowly defined crafting measures (the JCS, JCM, and JCQ). This could be because the OJCS is conceptualized as representing "inclusive, general, and abstract" job crafting and does not contain very specific components of job crafting. This sort of measures tapping broadly defined constructs usually have a slightly weaker predictive validity than narrowly defined measures (Judge & Kammeyer-Mueller, 2012). This is also manifested in the CJCS, too much information would be lost if it would only focus on task crafting since task crafting, relational crafting, and cognitive crafting are all integrated parts of job crafting. When matching the specificity of a job crafting measure to positive work-related outcomes to be predicted, the JCS performs better than the others.

Theoretical contributions and practical implications

Zhang and Parker (2019) synthesized a new job crafting type by combining approach-oriented crafting with job demands –

hindering demands can be crafted in an approach-oriented way (Zhang & Parker, 2019, p. 7). However, so far empirical evidence for this assumption was lacking. Most job crafting studies treat avoidance job crafting as a sort of passive withdrawal behaviour that affects wellbeing negatively. The first important theoretical contribution of our study is that it clarifies the blurred areas in the conceptualization of avoidance job crafting and provides empirical evidence for the synthesized job crafting concept of Zhang and Parker (2019). For example, when people decrease their hindrance job demands with a positive attitude (i.e., active coping), hindrance demands management is an effective type of self-regulation that may be less detrimental to work engagement than indulging in negative action tendencies with passive withdrawal. When people decrease their hindrance job demands with a negative passive attitude (such as shrinking work boundaries), hindrance demands management is a dysfunctional form of self-regulation that may lead to withdrawal of effort from the job.

Second, our study revealed that behaviour crafting overlaps empirically with cognitive crafting, in that behaviour crafting draws on cognitive perception as an important part of their theory. This finding is consistent with the proposition that cognitive crafting and behavioural crafting are reciprocally related (Tims et al., 2012; Zhang & Parker, 2019). This means that "positive" interventions aiming at promoting employees' behaviour changes may focus on improving individuals' knowledge structure and cognitive understanding of the job tasks. Further, when employees engage in job crafting behaviour, active coping behaviour must be distinguished from withdrawal behaviour, in that the former may be a good way for employees to reduce job stress and to stay healthy and engaged, while the latter represents poor adjustment and may disrupt organizational functioning.

A third contribution concerns the inconsistent zones of job crafting conceptualizations, for instance, the association between role identities and motivation. People prefer to act and make sense of situations in identity-congruent ways, but this does not necessarily mean that role identities crafting results in higher work motivation. The implications of role identities for action and meaning-making are not fixed but depend on situational features (Nurra & Oyserman, 2018). Our study showed that job characteristics crafting plays a more fundamental role than role identities crafting in predicting work engagement and innovation behaviour. That is, the motivation to exert effort on behalf of role identities may be directed to the situational activation of a work role. In addition, some researchers assume that behaviour crafting and cognitive crafting might occur together (Berg, Wrzesniewski et al., 2010; Wrzesniewski & Dutton, 2001); however, to date this remains an untested assumption. Our findings provide initial evidence that behaviour crafting and cognitive crafting are indeed interrelated and tend to occur together. Hence, our study sheds new light on the psychological mechanism in avoidance job crafting and calls for a better understanding of the boundary conditions of job characteristics crafting and role identities crafting as well as behaviour crafting and cognitive crafting.

Study limitations

First, the use of self-report questionnaires to assess the five job crafting variables and the study outcome variables raises

the problem of common method variance and construct overlap. Future research should test the incremental validity of these scales using non-self-reported criteria, possibly by using other-reported measures of job crafting or work outcomes.

Second, the sample size (162 health professionals and 202 R & D employees) for exploratory factor analysis (EFA) may raise the trustworthiness problem. However, the issue of establishing sufficient sample size for EFAs is not straightforward (cf. Pearson & Mundform, 2010). Some researchers suggested using absolute numbers of subjects as guidelines, e.g., Kline (1994) suggested that EFA requires at least 100 subjects. Others suggested particular minimum ratios of sample size to the number of variables, for example, Cattell (1978) suggested that three to six subjects per variable would be needed. Yet others argued that EFA is useful as long as a meaningful and interpretable set of factors can be identified, regardless of the measurement level of the input data (Johnson & Wichern, 2002). Since the factor structure obtained in our study was cross-validated across two different samples, we argue that it is likely to reflect a truly existing structure.

Third, to establish the convergent and discriminant validity of job crafting, we used two different samples and two different designs: a cross-sectional design among health professionals and a 6-month longitudinal design among R&D employees, linking job crafting to work engagement and innovation behaviour. In spite of using a methodologically stronger design, work engagement and innovation behaviour in T2 among R&D employees were not always significantly connected with job crafting. The 6-month lag used for the panel study might be not optimal for job crafting research. Future research testing the validity of various job crafting scales will benefit from the attempts to choose appropriate time lags in estimating optimally lagged effects of job crafting on work engagement and innovation behaviour.

Fourth, relation-extension alters the quality of informal social relationships, similar to *guanxi* exchange – a typically Chinese concept, which is based on a relational exchange of benefits and rewards with a high level of the exhausted effort (Hu et al., 2016). Although relation-extension of JCM is mainly placed on the first factor, Table 2 indicates that cultural effects are trivial and negligible, the positive component shared with the contraction of role identities on the second factor connotes that actively changing the boundaries around social activity and interpersonal interaction would contain maladaptive elements. Future research should consider the specific role of relation-extension in job crafting.

Finally, the JCS appeared a superior predictor with regard to the two criterion variables used in this study (work engagement and innovation behaviour). However, it is unclear whether the JCS is also a better predictor of other outcomes, such as job performance. Similarly, active coping behaviour predicted work engagement and innovation behaviour better than withdrawal behaviour. Whether these findings pertain to meaningful and generalizable patterns concerning the content and specificity of both “avoidance-type” job crafting behaviours, and whether they predict other dependent measures (such as health-related outcomes) in a similar vein, remain questions that need to be addressed in the future research.

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ORCID

Maureen F. Dollard  <http://orcid.org/0000-0002-3128-8727>

Wilmar B. Schaufeli  <http://orcid.org/0000-0002-6070-7150>

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